Remarks

Claims 1, 3- 5, 12-14, 21 and 24 have been amended and new claims 28-31 have been added as shown above. Support for the claim amendments and new claims may be found in the specification at, e.g., paragraphs 0015, 0017-0019, 0045 and 0066, and in claims 4, 5 and 16. Following entry of this amendment, claims 1-33 will be pending in this application.

Reconsideration of the rejections is requested in view of the following remarks.

Rejection of Claims 1-6, 8-13, 17-19 and 24-27 under 35 U.S.C. §102(b)

Claims 1-6, 8-13, 17-19 and 24-27 were rejected under 35 U.S.C. 102(b) as being anticipated by Urethane/Acrylic Composite Polymer Emulsions (Okamoto et al.), on grounds that:

"Okamoto teaches blends of waterborne urethane and acrylic polymer systems which can be used as floor coatings and paper finishes, among other applications. The disclosed blend functions as a single package, ambient temperature crosslinking emulsion (see Abstract). The system is a polymer blend composed of an acrylic polymer emulsion containing keto or aldo groups and a polyurethane dispersion containing hydrazine groups (col. 2, line 19-23). The acrylic polymer is prepared using 2-ethylhexylacrylate, methyl methacrylate, styrene, and acrylic acid, as well as diacetone acrylamide (DAAM). The keto group from DAAM provides the reactive functional group for the acrylic polymer component. The calculated glass transition temperature of the acrylic emulsion preferably ranges from -10 to 10 °C (col. 3, line 1840). Polyurethane polymers to be used in the disclosed composition are prepared from adipic acid, 1,6-hexanediol, 2,2-dimethylol propionic acid, cyclohexane dimethanol, and 4,4'-dicyc'ohexyl methane diisocyanate (col. 3, line 46-48). Such a composition reads on that of instant claims 12 and 13 wherein an aliphatic diisocyanate and a polyester polyol is used. Polyurethanes with hydrazine groups at the terminus of the polymer were obtained by adding an excess of hydrazine (col. 2, line 59-col. 3, line 12). The reference discloses solvent resistance studies wherein the ratio of acrylic polymer/polyurethane polymer is varied (Fig. 7). A composition comprising a 1:1 ratio of

hydrazine functionalized polyurethane and diacetone functionalized polyacrylate is clearly shown (System A). Such a composition reads on the instantly claimed compositions comprising 10 to 90 weight percent of both the vinyl addition and polyurethane polymers. Films were prepared by casting the aqueous emulsions onto glass plates followed by drying for 1 week at ambient temperature (-23 °C) (col. 4, line 35-38). Being that the disclosed compositions cure at ambient temperature, it is assumed that the drying step of the coating formation process acts as a curing/crosslinking step. Although the reference does not generically disclose the use of additives in the disclosed composition, the paint formulations given in Table 3 cite the addition of pigments and thickeners which clearly reads on the limitation of instant claim 17." (see the Office Action at pages 2-4).

Reconsideration is requested. Rejected independent claims 1 and 24 have been amended to recite that the polyurethane dispersion has a second crosslinkable functional end group comprising an "acetoacetoxyl or diacetone" group or combination thereof. Okamoto et al. do not show such groups on their polyurethane dispersions. Applicants accordingly request withdrawal of the 35 U.S.C. §102(b) rejection of claims 1-6, 8-13, 17-19 and 24-27 as being anticipated by Okamoto et al.

Rejection of Claim 7 under 35 U.S.C. §103

Claim 7 was rejected under 35 U.S.C. §103(a) as being unpatentable over Okamoto et al. as applied to claims 1-6, 8-13, 17-19 and 24-27 above, and further in view of U.S. Patent No. 4,978,708 (Fowler et al.), on grounds that:

"Okamoto teaches the aforementioned urethane/acrylate dispersion comprising a diactone-functionalized acrylic polymer and a hydrazide-functionalized polyurethane polymer. The disclosed composition has been shown to be substantially similar to that as claimed in the prior art. Suitable acrylate polymers comprise 2-ethylhexylacrylate, methyl methacrylate, styrene, and acrylic acid. However, the prior art does not disclose a preferred acid number for said acrylate polymer.

"Fowler teaches aqueous-based coating compositions comprising anionic polyurethane resins and anionic acrylic grin resins. The acrylic copolymers to be used in the invented composition consist of 60-90% by weight of one or more monomers selected from

the group consisting of a C_{1-20} alkyl acrylates, methacrylates, and styrene as well as 5-20% by weight of an a,β-unsaturated carboxylic acid selected from a group including acrylic acid. According to the disclosure, the amount of carboxylic acid monomer used is chosen so that the anionic acrylic copolymer possesses an acid number preferably between about 30 and 70. Best dispersion results are obtained when the acid number falls within this range (col. 12, line 33-55). Therefore, it would have been obvious to one having ordinary skill in the art to have prepared the acrylic polymer generically disclosed in Okamoto having an acid number within the range disclosed in Fowler so as to obtain an ideal dispersion." (see the Office Action at pages 4-5).

Applicants agree that Okamoto et al. do not disclose a preferred acid number for their acrylate polymer, and request reconsideration of the remainder of the rejection in view of the amendment to claim 1 discussed above. Even if Okamoto et al. and Fowler were to be combined as proposed in the Office Action, the result would not provide a composition containing applicants' recited polyurethane dispersions. Applicants accordingly request withdrawal of the 35 U.S.C. §103(a) rejection of claim 7 as being unpatentable over Okamoto et al. as applied to claims 1-6, 8-13, 17-19 and 24-27 above, and further in view of Fowler et al.

Rejection of Claims 14-16 and 20-23 under 35 U.S.C. §103

Claims 14-16 and 20-23 were rejected under 35 U.S.C. §103(a) as being unpatentable over Okamoto et al. as applied to claims 1-6, 8-13, 17-19, and 24-27 above, and further in view of U.S. Patent No. 6.063,861 (Irle et al.), on grounds that:

"Okamoto teaches the aforementioned urethane/acrylate dispersion comprising an acrylic polymer dispersion and a polyurethane polymer dispersion. The disclosed composition can be used to produce a variety of coatings including paper finishes. Furthermore, the composition has been shown to be substantially similar to that as is claimed in the instant application. However, the reference does not mention the inclusion of a crosslinking agent.

"Irle teaches self crosslinkable polyurethane-polyacrylate hybrid dispersions comprising a polyurethane dispersion and a polyacrylate polymer as well as a

difunctional amine (see abstract). The reference discloses that it has been described that polyurethane-polyacrylate hybrid dispersion which have carbonyl functional groups and polyfunctional amines form a stable, self-crosslinking, one component composition (col. 2, line 4-11). It has been held that the selection of a known material based on its suitability for its intended use supports a prima facie case of obviousness (Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945)). Therefore, it would have been obvious to have added a polyamine crosslinking component to the composition disclosed by Okamoto to form a storage-stable, self-crosslinking, one component composition. Regarding the amount of said polyamine used, although a preferred amount of amine is not generically disclosed in the reference, examples B3-B7 (col. 7, line 40-56) show the use of 0.73 to 12.8 wt. % of diethylenetriamine in the polyurethane-polyacrylate dispersions. Such amounts fall within the range claimed in the instant application.

"Furthermore, regarding claim 23, the composition taught by Irle can be used as a binder in compositions for coating wood (col. 6, line 26-31). Being that the compositions taught by Irle and Okamoto are analogous to each other, it would have been obvious to one having ordinary skill in the art to have tried using the composition taught by Okamoto further comprising the crosslinker taught by Irle as a coating composition for wooden surfaces." (see the Office Action at pages 5-6).

Applicants agree that Okamoto et al. do not mention use of a crosslinking agent, and request reconsideration of the remainder of the rejection.

Rejected independent claims 14, 21 and 24 recite combinations of functional groups which are not employed by Okamoto et al. or Irle et al., and which would not be employed if Okamoto et al. and Irle et al. were to be combined as proposed in the Office Action.

Rejected independent claim 20 recites a composition containing a vinyl addition latex polymer having "an acid number of between about 10 to 60". The Office Action elsewhere acknowledged that Okamoto et al. do not disclose a preferred acid number for their acrylate polymer. Irle et al. do not list any acidic monomers among the monomers they say can be employed for making their vinyl polymers (see e.g., col. 4, line 54 through col. 5, line 2). Irle et al. also say:

"While monomers having hydroxyl or acid groups, e.g., hydroxyethyl (meth)acrylate or (meth)acrylic acid, may be used; ***preferably, no monomers with acid functional groups are included in the polymerization.*** *"* (col. 5, lines 3-6, emphasis added).

and

"The resulting polyurethane-polyacrylate hybrid dispersion contains acid functional groups and acetoacetoxy functional groups. The acetoacetoxy groups incorporated are incorporated exclusively into the polyacrylate portion, while the acid groups are preferably incorporated into the polyurethane portion." (col. 5, lines 60-63)

If asked to consider the matter, a person having ordinary skill in the art who reviewed Okamoto et al. and Irle et al. would conclude that Irle et al. teaches away from vinyl polymers containing acid groups, and that the proposed combination of Okamoto et al. and Irle et al. would not show or suggest a composition containing a vinyl addition latex polymer having an acid number of between about 10 to 60.

Applicants accordingly request withdrawal of the 35 U.S.C. §103(a) rejection of claims 14-16 and 20-23 as being unpatentable over Okamoto et al. as applied to claims 1-6, 8-13, 17-19 and 24-27 above, and further in view of Irle et al.

Conclusion

Applicants have made an earnest effort to address each of the rejections. Withdrawal of the rejections and allowance of applicants' claims are requested. The Examiner is also requested to call the undersigned attorney if there are any questions regarding the application or this amendment.

Respectfully submitted on behalf of

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